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CLAIMS

[Claim(s)]

[Claim 1] A transport-vehicle crime prevention recording system comprising:

An imaging means which picturizes an image from a vehicle.

A halt condition detection means to detect that a vehicle has stopped.

A running state detecting means which detects that a vehicle is running.

A data recording means which will interrupt record of an image picturized in said imaging means if it detects that will record an image picturized in said imaging means, and a vehicle will run in said running state detecting means if it detects that a vehicle has stopped by said halt condition detection means.

[Claim 2] Detect that a vehicle has stopped said halt condition detection means when speed of an acquired vehicle is below speed defined beforehand, and said running state detecting means, The transport-vehicle crime prevention recording system according to claim 1 characterized by what it detects that a vehicle is running for when speed of an acquired vehicle is larger than speed defined beforehand.

[Claim 3] The transport-vehicle crime prevention recording system according to claim 1 or 2 characterized by what it detects that a vehicle has stopped said halt condition detection means when an engine of a vehicle changes from activation status to a halt condition for.

[Claim 4] The transport-vehicle crime prevention recording system according to claim 1, 2, or 3 characterized by what it detects that a vehicle has stopped said halt condition detection means during time when vibration of the body acquired from a gyro sensor installed in a vehicle was defined beforehand when it is below a value defined beforehand for.

[Claim 5] Have a personal approach detection means which detects that human being is approaching within limits defined beforehand from a vehicle, and said data recording means, If it detects that will record an image picturized in said imaging means, and a vehicle will run in said run state recording device if it detects that there is an approaching person in said personal approach detection means, A transport-vehicle crime prevention recording system given in any 1 paragraph of claims 1 thru/or 4 characterized by what record of an image picturized in said imaging means is interrupted for.

[Claim 6] Have an impact detection means which detects a shock more than a value to a vehicle defined beforehand, and said data recording means, A transport-vehicle crime prevention recording system given in any 1 paragraph of claims 1 thru/or 5 characterized by what record of an image picturized in said imaging means will be

started for if a shock is detected in said impact detection means.

[Claim 7]Have a date data creating means which generates date data used as the present date and time, and a position data generating means which generates position data used as a position of the present vehicle, and said data recording means, A transport-vehicle crime prevention recording system given in any 1 paragraph of claims 1 thru/or 6 characterized by what date data generated in said date data creating means and position data generated in said position data generating means are recorded for in addition to an image picturized in said imaging means.

[Claim 8]A transport-vehicle crime prevention recording system given in any 1 paragraph of claims 1 thru/or 7 characterized by what said data recording means is protected for by case for realizing prevention and endurance defined beforehand of an alteration of a recorded image and a sound.

[Claim 9]A crime prevention record method comprising:

An image pick-up step which picturizes an image from a vehicle.

A halt condition detecting step which detects that a vehicle has stopped.

A run state detecting step which detects that a vehicle is running.

A data recording step which will interrupt record of an image picturized at said image pick-up step if it detects that will record an image picturized at said image pick-up step, and a vehicle will run in said run state detecting step if it detects that a vehicle has stopped in said halt condition detecting step.

[Claim 10]An image pick-up step which is a recording medium which records a program as which a computer is operated as a transport-vehicle crime prevention recording system, and in which computer reading is possible, and picturizes an image from a vehicle, A halt condition detecting step which detects that a vehicle has stopped, and a run state detecting step which detects that a vehicle is running, If it detects that a vehicle has stopped in said halt condition detecting step, If it detects that record an image picturized at said image pick-up step, and a vehicle is running in said run state detecting step, A recording medium which is characterized by what a program which realizes a data recording step which interrupts record of an image picturized at said image pick-up step is memorized for and in which computer reading is possible.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the transport-vehicle crime

prevention recording system, crime prevention record method, and recording medium which can grasp exactly the generation state of the burglar incident at the time of a cash transport truck etc. being attacked.

[0002]

[Description of the Prior Art] Guards who have ridden with the transport vehicle at the time of the occurrence of a burglar incident that a cash transport truck etc. are attacked conventionally inform a security center and the police of the occurrence of an incident promptly by radio etc., and they strive to prevent robbery of cash etc. When it is able to prevent, or when cash etc. are seized, after the criminal has escaped, it is necessary to grasp exactly the burglar incident generation state of a criminal's number, physiognomy, the physique, sex, age, and a means. Therefore, investigators grasp a burglar incident generation state by testimony obtained from analysis, a guard, a witness of various **** etc. which were left behind after the occurrence of a burglar incident, etc. It was difficult at that time to catch an incident generation state exactly from **** etc. which were left behind after the occurrence of an incident, and a guard's etc. testimony in many cases. If an incident generation state is not caught exactly, a criminal's arrest will not take time, a criminal deterrent effect will not be acquired an arrest not only becomes difficult, but, but the further, same crime will be induced.

[0003] In recent years, transmit the picture information at the time of the occurrence of a burglar incident which is indicated by JP,8-171682,A to a security center by radio, and notify the occurrence of an incident, and. The same picture information as the transmitted information is recorded on a frame memory, and the art in which it catches the generation state of a burglar incident is exhibited.

[0004]

[Problem(s) to be Solved by the Invention] However, when the sensor with which the door of the cargo compartment of a cash transport truck was equipped detects opening of a door, the art currently indicated by JP,8-171682,A starts photography and transmits the acquired picture information to a security center. For this reason, it was difficult to stop at photoing the mere part in the burglar incident in which the door of the cargo compartment of a transport vehicle can open, and to catch the whole picture of a burglar incident exactly.

[0005] When the electric wave [high power / for disturbance of the frequency band used for radio] was generated or the antenna for communication, etc. were destroyed, there was a possibility that the photoed picture information might not reach a security center. Equipments for exclusive use were needed for reproducing the case where data volume of the picture information whose preservation is attained from the capacity of a frame memory cannot secure enough, and the picture recorded on the frame memory, and there was also a possibility of causing the delay in initial criminal investigation.

[0006] This invention was made in view of the above-mentioned actual condition, and an object of this invention is to provide the transport-vehicle crime prevention recording system, crime prevention record method, and recording medium which can grasp exactly the generation state of the burglar incident by which the cash transport truck etc. were attacked.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, a transport-vehicle crime prevention recording system concerning the 1st viewpoint of this invention is provided with the following.

An imaging means which picturizes an image from a vehicle.

A halt condition detection means to detect that a vehicle has stopped.

If it detects that a vehicle has stopped by running state detecting means which detects that a vehicle is running, and said halt condition detection means, A data recording means which will interrupt record of an image picturized in said imaging means if it detects that record an image picturized in said imaging means, and a vehicle is running in said running state detecting means.

[0008]According to this invention, an imaging means picturizes an image of a range beforehand defined from a vehicle. An image picturized in an imaging means when it detected that a vehicle had stopped a data recording means by a halt condition detection means is recorded, and if it detects that a vehicle is running in a running state detecting means, record of an image picturized in an imaging means will be interrupted. As a result, since a picture of a prescribed range in a halt condition of a transport vehicle which will be the requisite which a burglar incident generally generates is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0009]It detects that a vehicle has stopped said halt condition detection means when speed of an acquired vehicle is below speed defined beforehand, and said running state detecting means may detect that a vehicle is running, when speed of an acquired vehicle is larger than speed defined beforehand. In this case, it detects that a vehicle has stopped a halt condition detection means when a speed value which acquired a speed value of a transport vehicle with a velocity sensor etc., and acquired it is 0 km/h. A running state detecting means detects that a vehicle is running, when an acquired speed value is larger than 0 km/h.

[0010]Said halt condition detection means may detect that a vehicle has stopped, when an engine of a vehicle changes from activation status to a halt condition.

[0011]During time when vibration of the body acquired from a gyro sensor installed in a vehicle was defined beforehand, said halt condition detection means may detect that a vehicle has stopped, when it is below a value defined beforehand.

[0012]Have a personal approach detection means which detects that human being is approaching within limits defined beforehand from a vehicle, and said data recording means, An image picturized in said imaging means when it detected that there was an approaching person in said personal approach detection means is recorded, and if it detects that a vehicle is running in said run state recording device, record of an image picturized in said imaging means may be interrupted. In this case, since a picture of a person close to a transport vehicle is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0013]It has an impact detection means which detects a shock more than a value to a vehicle defined beforehand, and said data recording means may start record of an image picturized in said imaging means, if a shock is detected in said impact detection means. In this case, since a shock which is going to stop a transport vehicle forcibly is detected and a picture of a predetermined range is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0014]Have a date data creating means which generates date data used as the present date and time, and a position data generating means which generates position data used as a position of the present vehicle, and said data recording means, In addition to an image picturized in said imaging means, date data generated in said date data creating means and position data generated in said position data generating means may be recorded.

[0015]Said data recording means may be protected by case for realizing prevention

and endurance defined beforehand of an alteration of a recorded image and a sound.
[0016]In order to attain the above-mentioned purpose, a crime prevention record method concerning the 2nd viewpoint of this invention is provided with the following.

An image pick-up step which picturizes an image from a vehicle.

A halt condition detecting step which detects that a vehicle has stopped.

If it detects that a vehicle has stopped in a run state detecting step which detects that a vehicle is running, and said halt condition detecting step, A data recording step which will interrupt record of an image picturized at said image pick-up step if it detects that record an image picturized at said image pick-up step, and a vehicle is running in said run state detecting step.

[0017]According to this invention, an image pick-up step picturizes an image of a range beforehand defined from a vehicle. An image picturized at an image pick-up step when it detected that a vehicle had stopped a data recording step in a halt condition detecting step is recorded, and if it detects that a vehicle is running in a run state detecting step, record of an image picturized at an image pick-up step will be interrupted. As a result, since a picture of a prescribed range in a halt condition of a transport vehicle which will be the requisite which a burglar incident generally generates is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0018]In order to attain the above-mentioned purpose, a recording medium concerning the 3rd viewpoint of this invention, An image pick-up step which is a recording medium which records a program as which a computer is operated as a transport-vehicle crime prevention recording system, and in which computer reading is possible, and picturizes an image from a vehicle, A halt condition detecting step which detects that a vehicle has stopped, and a run state detecting step which detects that a vehicle is running, If it detects that a vehicle has stopped in said halt condition detecting step, An image picturized at said image pick-up step is recorded, and if it detects that a vehicle is running in said run state detecting step, a program which realizes a data recording step which interrupts record of an image picturized at said image pick-up step will be memorized.

[0019]

[Embodiment of the Invention]The transport-vehicle crime prevention recording system concerning an embodiment of the invention is explained with reference to drawings below.

[0020]Drawing 1 is a mimetic diagram showing the composition of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. This transport-vehicle crime prevention recording system is provided with the imaging device 1, the sound-collecting device 2, the vehicle sensor 3, the A/D (analog to digital) converter 4, the data compression part 5, the processing control part 6, and the data recording part 7 as shown in drawing 1.

[0021]The imaging device 1 is arranged at the place where the transportation vehicle was defined beforehand, as shown in drawing 2, it acquires the image of the prescribed range picturized from the locating position, generates the video signal of an animation, and supplies it to the A/D conversion part 4 one by one. Two or more imaging devices 1 may be arranged, and two or more images may be acquired at the period.

[0022]The sound-collecting device 2 is arranged at the place where the transportation vehicle was defined beforehand, as shown in drawing 2, it acquires the sound etc.

which collected the sound from the locating position, generates an audio signal, and supplies it to the A/D conversion part 4 one by one. Two or more sound-collecting devices 2 may be arranged, and two or more sounds may be acquired.

[0023]The vehicle sensor 3 consists of a speed sensor, an acceleration sensor, a brake sensor, etc., acquires vehicle speed information, acceleration information, and brakes operation information one by one, respectively, and supplies them to the A/D conversion part 4.

[0024]The A/D (analog to digital) converter 4 changes into a digital signal various analog signals inputted from the imaging device 1, the sound-collecting device 2, and the vehicle sensor 3, such as a video signal and an audio signal, and supplies them to the data compression part 5 and the processing control part 6 one by one.

[0025]The data compression part 5 compresses picture image data, voice data, etc. which were received from the A/D conversion part 4 with the compression technology which was able to be defined beforehand, for example, an MPEG (Motion Picture Expert Group) method, and supplies them to the data recording part 7.

[0026]The processing control part 6 controls the whole transport-vehicle crime prevention recording system. The processing control part 6 will start record of the picture and sound which were acquired from the imaging device 1 and the sound-collecting device 2, if the speed information sent from the vehicle sensor 3 via the A/D conversion part 4 becomes below in the speed defined beforehand. That is, the processing control part 6 controls the A/D conversion part 4, the data compression part 5, and the data recording part 7, doubles timing with the output of the picture image data from the A/D conversion part 4, voice data, etc., and memorizes the data which compressed data one by one and compressed it by the data compression part 5 one by one to the data recording part 7.

[0027]It consists of VTRs (videotape recorder) etc., the videotape of the storage capacity defined beforehand is built in, and the data recording part 7 records the compressed data supplied from the data compression part 5 one by one. The data recording part 7 is arranged behind [which cannot be shocked comparatively easily] a transportation vehicle, as shown in drawing 2, and it is locked with a key for exclusive use.

[0028]Next, crime prevention data recording processing of the transport-vehicle crime prevention recording system concerning this embodiment of the invention is explained with reference to drawing 3. Drawing 3 is a flow chart explaining the crime prevention data recording processing in this transport-vehicle crime prevention recording system. Crime prevention data recording processing is started by predetermined operation in predetermined departure point, for example, security center.

[0029]First, the processing control part 6 acquires the speed information sent from the vehicle sensor 3 via the A/D conversion part 4 (Step S1). The processing control part 6 distinguishes whether the acquired speed information is 0 km/h (Step S2). That is, the processing control part 6 distinguishes whether it is the state which the transport vehicle has stopped. When the acquired speed information is not 0 km/h, the processing control part 6 returns to Step S1, and repeats processing. On the other hand, when the acquired speed information is 0 km/h, the processing control part 6 carries out analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 via the A/D conversion part 4, and inputs picture image data, voice data, etc. which were changed (Step S3).

[0030]The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 with the method which was able to be defined beforehand, for example, an MPEG system, (step S4).

[0031]The processing control part 6 memorizes the picture image data and voice data which were compressed by the data compression part 5 one by one by the data recording part 7 (Step S5).

[0032]The processing control part 6 returns to Step S1, and repeats the above-mentioned processing. That is, if the processing control part 6 distinguishes that the transport vehicle began the run at Step S2, it will stop the record of a picture and a sound which was being performed by the data recording part 7. Crime prevention data recording processing is ended by predetermined operation in predetermined point of arrival, for example, security center.

[0033]As a result, since the picture and sound of a prescribed range in the halt condition of the transport vehicle which will be the requisite which a burglar incident generally generates are recorded automatically, when a burglar incident occurs, the generation state of an incident can be grasped exactly. Even when an incident does not occur, by managing the videotape which recorded the picture and the sound, the sign of a burglar incident can be caught and a measure can also be taken.

[0034]Although the data which compressed the picture and the sound by the data compression part 5 was recorded by the data recording part 7 in the above-mentioned embodiment, it may record as it is, without compressing. With general-purpose equipments, since the videotape recorded as it was without being compressed is refreshable, causing the delay in the initial criminal investigation at the time of the occurrence of a burglar incident of it is lost.

[0035]In the above-mentioned embodiment, when the speed information acquired from the vehicle sensor 3 became 0 km/h, record of the picture and the sound was started, but the value of the speed information which starts record is arbitrary. For example, record may be started if the speed information acquired from the vehicle sensor 3 will be 10 km/h or less. Record may be started with combination with the acceleration information acquired from the vehicle sensor 3, and brakes operation information.

[0036]In the above-mentioned embodiment, when the speed information acquired from the vehicle sensor 3 became 0 km/h, record of the picture and the sound was started, but if the engine of a transport vehicle stops, record of a picture and a sound may be started. For example, it enables it to distinguish starting and a stop of an engine by the vehicle sensor 3, and record may be started when an engine changes from activation status to a halt condition. It has a gyro sensor etc. further, and during the time when vibration of the body acquired from the gyro sensor was defined beforehand, when it is below the value defined beforehand, record may be started.

[0037]In an above-mentioned embodiment, although the imaging device 1 was installed in the part where the transportation vehicle was defined beforehand and acquired the image of the prescribed range from the installed position, it may make the imaging device 1 pivotable and may change a photographing area. For example, the imaging device 1 may be installed on an electric turntable controllable at the processing control part 6, an audio source of release may be caught from the strength etc. of the sound acquired from two or more sound-collecting devices 2, and the photographing area of the imaging device 1 may be automatically changed by the processing control part 6. The installation place of the imaging device 1 is arbitrary. For example, it may install in the cargo compartment of transportation vehicles, and

the image inside a cargo compartment may be acquired, or it may install in a driver's seat, and the image of a driver's seat may be acquired.

[0038]In the above-mentioned embodiment, when the state of the transport vehicle acquired from the vehicle sensor 3 changed into the state where it was set beforehand, record of the picture and the sound was started, but it may detect that the unspecified person approached the transport vehicle, and record may be started. The data recording part 7 may be made to memorize a date and time information further. The modification of the transport-vehicle crime prevention recording system concerning this embodiment of the invention that detects hereafter that the unspecified person approached the transport vehicle, and memorizes a picture, a sound, and date data is explained.

[0039]Drawing 4 is a mimetic diagram showing the composition of the modification of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. The transport-vehicle crime prevention recording system shown in drawing 4 has the composition of having added the proximity sensor 21, and a date and a time generation part 22 to the transport-vehicle crime prevention recording system shown in drawing 1.

[0040]The proximity sensor 21 consists of an infrared sensor arranged at the place appointed beforehand, an ultrasonic sensor, etc. of a transportation vehicle, if approach of an unspecified person is detected within limits defined beforehand, such as a rear door and near a driver's seat door, will generate an approach detecting signal and will supply it to the A/D conversion part 4.

[0041]A date and the time generation part 22 generate the date data in which a present date and time are shown, and supplies it to the processing control part 6.

[0042]Hereafter, crime prevention data recording processing of the transport-vehicle crime prevention recording system shown in drawing 4 is explained briefly. The processing control part 6 will memorize first the date data generated by the date and the time generation part 22 by the data recording part 7, if the approach detecting signal sent from the proximity sensor 21 via the A/D conversion part 4 is acquired.

[0043]Then, the processing control part 6 carries out analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 via the A/D conversion part 4, and inputs picture image data, voice data, etc. which were changed. The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 by the method which was able to be defined beforehand, and memorizes compressed data one by one by the data recording part 7.

[0044]The processing control part 6 will stop the record of a picture and a sound which was being performed by the data recording part 7, if it distinguishes that the transport vehicle began the run from the speed information acquired from the vehicle sensor 3. As a result, since the picture and sound of the person close to a transport vehicle are recorded automatically, the generation state of a burglar incident can be grasped exactly.

[0045]Although record of the picture and the sound was started according to the start condition of the predetermined record acquired from the vehicle sensor 3 and the proximity sensor 21 and record of the picture and the sound was stopped in the above-mentioned embodiment according to the condition precedent of predetermined record, It detects, and while it is recordable on the recording medium of the data recording part 7, recording that the transport vehicle was attacked may be continued. The position data of a transport vehicle may be further recorded on the data

recording part 7. Other modifications of the transport-vehicle crime prevention recording system concerning this embodiment of the invention that detects a shock etc. in a transport vehicle and memorizes a picture, a sound, and position data hereafter are explained.

[0046]Drawing 5 is a mimetic diagram showing the composition of other modifications of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. The transport-vehicle crime prevention recording system shown in drawing 5 has the composition of having added the malfunction detection sensor 31 and the position information generation part 32 to the transport-vehicle crime prevention recording system shown in drawing 1.

[0047]The malfunction detection sensor 31 consists of the impact sensor, vibration sensor, and acceleration sensor which have been arranged at places appointed beforehand, such as the front of a transportation vehicle, if the shock more than the value defined beforehand, etc. are detected, will generate a malfunction detection signal and will supply it to the A/D conversion part 4.

[0048]The position information generation part 32 receives the electric wave from two or more satellites which can be set to GPS (Global Positioning System), generates the present position information by the propagation delay time, and supplies it to the processing control part 6.

[0049]Hereafter, crime prevention data recording processing of the transport-vehicle crime prevention recording system shown in drawing 5 is explained briefly. If the malfunction detection signal sent from the malfunction detection sensor 31 via the A/D conversion part 4 is acquired, the processing control part 6, Analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 is carried out via the A/D conversion part 4, and picture image data, voice data, etc. which were changed are inputted.

[0050]The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 by the method which was able to be defined beforehand, and memorizes compressed data one by one by the data recording part 7. The processing control part 6 acquires a predetermined time interval, for example, the position information which the position information generation part 32 generated at intervals of 1 minute, and memorizes it one by one to the data recording part 7.

[0051]Memorizing the processing control part 6 is continued until the storage capacity of the opening of the videotape used as the recording medium in the data recording part 7 is lost. As a result, while for the malfunction detection sensor 31 to detect that the transport vehicle was attacked, and it is recordable on the recording medium of the data recording part 7, in order to continue recording a picture, a sound, and position information, When robbed the whole transport vehicle, the whole picture of the incident of a to [from the generation state of a burglar incident / a criminal's escape route, the shipping-and-discharging place of intermediate cash, etc.] can be grasped exactly.

[0052]Although the position information on a transport vehicle was generated, and it combined with the picture and the sound and being recorded by the position information generation part 32 in the above-mentioned embodiment at the data recording part 7, Position information may be acquired in a security center etc. by having mobile communication apparatus, such as a PHS system, and continuing transmitting commo data from a mobile communication apparatus after detecting abnormalities by the malfunction detection sensor 31 instead of the position information generation part 32.

[0053]In an above-mentioned embodiment, although a picture, a sound, etc. were recorded on videotape by the data recording part 7, the recording medium is arbitrary. For example, it may record on semiconductor memory. The data recording part 7 may be protected by the case for realizing prevention and the endurance defined beforehand of an alteration of the recorded image, a sound, etc. The data recording part 7 is locked with a key for exclusive use, for example, accepts it in a security center, and is good also as unlocking being possible.

[0054]The system of this invention cannot be based on a system for exclusive use, but can be realized using the usual computer system. For example, the transport-vehicle crime prevention recording system which performs above-mentioned processing can be constituted by installing this program from the media (a floppy disk, CD-ROM, etc.) which stored the program for performing one of above-mentioned processings in the computer.

[0055]Communication media (medium which holds a program temporarily and fluidly like a communication line, a communication network, and a communications system) may be sufficient as the medium for supplying a program to a computer. For example, this program may be put up for the bulletin board (BBS) of a communication network, and this may be distributed via a network. And above-mentioned processing can be performed by starting this program and performing like other application programs under control of OS.

[0056]

[Effect of the Invention]As explained above, according to this invention, the generation state of the burglar incident by which the cash transport truck etc. were attacked can be grasped exactly.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the transport-vehicle crime prevention recording system, crime prevention record method, and recording medium which can grasp exactly the generation state of the burglar incident at the time of a cash transport truck etc. being attacked.

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EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, according to this invention, the generation state of the burglar incident by which the cash transport truck etc. were attacked can be grasped exactly.

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PRIOR ART

[Description of the Prior Art]Guards who have ridden with the transport vehicle at the time of the occurrence of a burglar incident that a cash transport truck etc. are attacked conventionally inform a security center and the police of the occurrence of an incident promptly by radio etc., and they strive to prevent robbery of cash etc. When it is able to prevent, or when cash etc. are seized, after the criminal has escaped, it is necessary to grasp exactly the burglar incident generation state of a criminal's number, physiognomy, the physique, sex, age, and a means. Therefore, investigators grasp a burglar incident generation state by testimony obtained from analysis, a guard, a witness of various **** etc. which were left behind after the occurrence of a burglar incident, etc. It was difficult at that time to catch an incident generation state exactly from **** etc. which were left behind after the occurrence of an incident, and a guard's etc. testimony in many cases. If an incident generation state is not caught exactly, a criminal's arrest will not take time, a criminal deterrent effect will not be acquired an arrest not only becomes difficult, but, but the further, same crime will be induced.

[0003]In recent years, transmit the picture information at the time of the occurrence of a burglar incident which is indicated by JP,8-171682,A to a security center by radio, and notify the occurrence of an incident, and. The same picture information as the transmitted information is recorded on a frame memory, and the art in which it catches the generation state of a burglar incident is exhibited.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, when the sensor with which the door of the cargo compartment of a cash transport truck was equipped detects opening of a door, the art currently indicated by JP,8-171682, A starts photography and transmits the acquired picture information to a security center. For this reason, it was difficult to stop at photoing the mere part in the burglar incident in which the door of the cargo compartment of a transport vehicle can open, and to catch the whole picture of a burglar incident exactly.

[0005] When the electric wave [high power / for disturbance of the frequency band used for radio] was generated or the antenna for communication, etc. were destroyed, there was a possibility that the photoed picture information might not reach a security center. Equipments for exclusive use were needed for reproducing the case where data volume of the picture information whose preservation is attained from the capacity of a frame memory cannot secure enough, and the picture recorded on the frame memory, and there was also a possibility of causing the delay in initial criminal investigation.

[0006] This invention was made in view of the above-mentioned actual condition, and an object of this invention is to provide the transport-vehicle crime prevention recording system, crime prevention record method, and recording medium which can grasp exactly the generation state of the burglar incident by which the cash transport truck etc. were attacked.

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MEANS

[Means for Solving the Problem]In order to attain the above-mentioned purpose, a transport-vehicle crime prevention recording system concerning the 1st viewpoint of this invention is provided with the following.

An imaging means which picturizes an image from a vehicle.

A halt condition detection means to detect that a vehicle has stopped.

If it detects that a vehicle has stopped by running state detecting means which detects that a vehicle is running, and said halt condition detection means, A data recording means which will interrupt record of an image picturized in said imaging means if it detects that record an image picturized in said imaging means, and a vehicle is running in said running state detecting means.

[0008]According to this invention, an imaging means picturizes an image of a range beforehand defined from a vehicle. An image picturized in an imaging means when it detected that a vehicle had stopped a data recording means by a halt condition detection means is recorded, and if it detects that a vehicle is running in a running state detecting means, record of an image picturized in an imaging means will be interrupted. As a result, since a picture of a prescribed range in a halt condition of a transport vehicle which will be the requisite which a burglar incident generally generates is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0009]It detects that a vehicle has stopped said halt condition detection means when speed of an acquired vehicle is below speed defined beforehand, and said running state detecting means may detect that a vehicle is running, when speed of an acquired vehicle is larger than speed defined beforehand. In this case, it detects that a vehicle has stopped a halt condition detection means when a speed value which acquired a speed value of a transport vehicle with a velocity sensor etc., and acquired it is 0 km/h. A running state detecting means detects that a vehicle is running, when an acquired speed value is larger than 0 km/h.

[0010]Said halt condition detection means may detect that a vehicle has stopped, when an engine of a vehicle changes from activation status to a halt condition.

[0011]During time when vibration of the body acquired from a gyro sensor installed in a vehicle was defined beforehand, said halt condition detection means may detect that a vehicle has stopped, when it is below a value defined beforehand.

[0012]Have a personal approach detection means which detects that human being is approaching within limits defined beforehand from a vehicle, and said data recording means, An image picturized in said imaging means when it detected that there was an approaching person in said personal approach detection means is recorded, and if it detects that a vehicle is running in said run state recording device, record of an image picturized in said imaging means may be interrupted. In this case, since a picture of a person close to a transport vehicle is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0013]It has an impact detection means which detects a shock more than a value to a vehicle defined beforehand, and said data recording means may start record of an image picturized in said imaging means, if a shock is detected in said impact detection means. In this case, since a shock which is going to stop a transport vehicle forcibly is detected and a picture of a predetermined range is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0014]Have a date data creating means which generates date data used as the present date and time, and a position data generating means which generates position data used as a position of the present vehicle, and said data recording means, In addition to an image picturized in said imaging means, date data generated in said date data creating means and position data generated in said position data generating means may be recorded.

[0015]Said data recording means may be protected by case for realizing prevention and endurance defined beforehand of an alteration of a recorded image and a sound.

[0016]In order to attain the above-mentioned purpose, a crime prevention record method concerning the 2nd viewpoint of this invention is provided with the following.

An image pick-up step which picturizes an image from a vehicle.

A halt condition detecting step which detects that a vehicle has stopped.

If it detects that a vehicle has stopped in a run state detecting step which detects that a vehicle is running, and said halt condition detecting step, A data recording step which will interrupt record of an image picturized at said image pick-up step if it detects that record an image picturized at said image pick-up step, and a vehicle is running in said run state detecting step.

[0017]According to this invention, an image pick-up step picturizes an image of a range beforehand defined from a vehicle. An image picturized at an image pick-up step when it detected that a vehicle had stopped a data recording step in a halt condition detecting step is recorded, and if it detects that a vehicle is running in a run state detecting step, record of an image picturized at an image pick-up step will be interrupted. As a result, since a picture of a prescribed range in a halt condition of a transport vehicle which will be the requisite which a burglar incident generally generates is recorded automatically, a generation state of a burglar incident can be grasped exactly.

[0018]In order to attain the above-mentioned purpose, a recording medium concerning the 3rd viewpoint of this invention, An image pick-up step which is a recording medium which records a program as which a computer is operated as a transport-vehicle crime prevention recording system, and in which computer reading is possible, and picturizes an image from a vehicle, A halt condition detecting step which detects that a vehicle has stopped, and a run state detecting step which detects that a vehicle is running, If it detects that a vehicle has stopped in said halt condition detecting step, An image picturized at said image pick-up step is recorded, and if it detects that a vehicle is running in said run state detecting step, a program which realizes a data recording step which interrupts record of an image picturized at said image pick-up step will be memorized.

[0019]

[Embodiment of the Invention]The transport-vehicle crime prevention recording system concerning an embodiment of the invention is explained with reference to drawings below.

[0020]Drawing 1 is a mimetic diagram showing the composition of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. This transport-vehicle crime prevention recording system is provided with the imaging device 1, the sound-collecting device 2, the vehicle sensor 3, the A/D (analog to digital) converter 4, the data compression part 5, the processing control part 6, and the data recording part 7 as shown in drawing 1.

[0021]The imaging device 1 is arranged at the place where the transportation vehicle

was defined beforehand, as shown in drawing 2, it acquires the image of the prescribed range picturized from the locating position, generates the video signal of an animation, and supplies it to the A/D conversion part 4 one by one. Two or more imaging devices 1 may be arranged, and two or more images may be acquired at the period.

[0022]The sound-collecting device 2 is arranged at the place where the transportation vehicle was defined beforehand, as shown in drawing 2, it acquires the sound etc. which collected the sound from the locating position, generates an audio signal, and supplies it to the A/D conversion part 4 one by one. Two or more sound-collecting devices 2 may be arranged, and two or more sounds may be acquired.

[0023]The vehicle sensor 3 consists of a speed sensor, an acceleration sensor, a brake sensor, etc., acquires vehicle speed information, acceleration information, and brakes operation information one by one, respectively, and supplies them to the A/D conversion part 4.

[0024]The A/D (analog to digital) converter 4 changes into a digital signal various analog signals inputted from the imaging device 1, the sound-collecting device 2, and the vehicle sensor 3, such as a video signal and an audio signal, and supplies them to the data compression part 5 and the processing control part 6 one by one.

[0025]The data compression part 5 compresses picture image data, voice data, etc. which were received from the A/D conversion part 4 with the compression technology which was able to be defined beforehand, for example, an MPEG (Motion Picture Expert Group) method, and supplies them to the data recording part 7.

[0026]The processing control part 6 controls the whole transport-vehicle crime prevention recording system. The processing control part 6 will start record of the picture and sound which were acquired from the imaging device 1 and the sound-collecting device 2, if the speed information sent from the vehicle sensor 3 via the A/D conversion part 4 becomes below in the speed defined beforehand. That is, the processing control part 6 controls the A/D conversion part 4, the data compression part 5, and the data recording part 7, doubles timing with the output of the picture image data from the A/D conversion part 4, voice data, etc., and memorizes the data which compressed data one by one and compressed it by the data compression part 5 one by one to the data recording part 7.

[0027]It consists of VTRs (videotape recorder) etc., the videotape of the storage capacity defined beforehand is built in, and the data recording part 7 records the compressed data supplied from the data compression part 5 one by one. The data recording part 7 is arranged behind [which cannot be shocked comparatively easily] a transportation vehicle, as shown in drawing 2, and it is locked with a key for exclusive use.

[0028]Next, crime prevention data recording processing of the transport-vehicle crime prevention recording system concerning this embodiment of the invention is explained with reference to drawing 3. Drawing 3 is a flow chart explaining the crime prevention data recording processing in this transport-vehicle crime prevention recording system. Crime prevention data recording processing is started by predetermined operation in predetermined departure point, for example, security center.

[0029]First, the processing control part 6 acquires the speed information sent from the vehicle sensor 3 via the A/D conversion part 4 (Step S1). The processing control part 6 distinguishes whether the acquired speed information is 0 km/h (Step S2). That is, the processing control part 6 distinguishes whether it is the state which the

transport vehicle has stopped. When the acquired speed information is not 0 km/h, the processing control part 6 returns to Step S1, and repeats processing. On the other hand, when the acquired speed information is 0 km/h, the processing control part 6 carries out analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 via the A/D conversion part 4, and inputs picture image data, voice data, etc. which were changed (Step S3).

[0030]The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 with the method which was able to be defined beforehand, for example, an MPEG system, (step S4).

[0031]The processing control part 6 memorizes the picture image data and voice data which were compressed by the data compression part 5 one by one by the data recording part 7 (Step S5).

[0032]The processing control part 6 returns to Step S1, and repeats the above-mentioned processing. That is, if the processing control part 6 distinguishes that the transport vehicle began the run at Step S2, it will stop the record of a picture and a sound which was being performed by the data recording part 7. Crime prevention data recording processing is ended by predetermined operation in predetermined point of arrival, for example, security center.

[0033]As a result, since the picture and sound of a prescribed range in the halt condition of the transport vehicle which will be the requisite which a burglar incident generally generates are recorded automatically, when a burglar incident occurs, the generation state of an incident can be grasped exactly. Even when an incident does not occur, by managing the videotape which recorded the picture and the sound, the sign of a burglar incident can be caught and a measure can also be taken.

[0034]Although the data which compressed the picture and the sound by the data compression part 5 was recorded by the data recording part 7 in the above-mentioned embodiment, it may record as it is, without compressing. With general-purpose equipments, since the videotape recorded as it was without being compressed is refreshable, causing the delay in the initial criminal investigation at the time of the occurrence of a burglar incident of it is lost.

[0035]In the above-mentioned embodiment, when the speed information acquired from the vehicle sensor 3 became 0 km/h, record of the picture and the sound was started, but the value of the speed information which starts record is arbitrary. For example, record may be started if the speed information acquired from the vehicle sensor 3 will be 10 km/h or less. Record may be started with combination with the acceleration information acquired from the vehicle sensor 3, and brakes operation information.

[0036]In the above-mentioned embodiment, when the speed information acquired from the vehicle sensor 3 became 0 km/h, record of the picture and the sound was started, but if the engine of a transport vehicle stops, record of a picture and a sound may be started. For example, it enables it to distinguish starting and a stop of an engine by the vehicle sensor 3, and record may be started when an engine changes from activation status to a halt condition. It has a gyro sensor etc. further, and during the time when vibration of the body acquired from the gyro sensor was defined beforehand, when it is below the value defined beforehand, record may be started.

[0037]In an above-mentioned embodiment, although the imaging device 1 was installed in the part where the transportation vehicle was defined beforehand and acquired the image of the prescribed range from the installed position, it may make

the imaging device 1 pivotable and may change a photographing area. For example, the imaging device 1 may be installed on an electric turntable controllable at the processing control part 6, an audio source of release may be caught from the strength etc. of the sound acquired from two or more sound-collecting devices 2, and the photographing area of the imaging device 1 may be automatically changed by the processing control part 6. The installation place of the imaging device 1 is arbitrary. For example, it may install in the cargo compartment of transportation vehicles, and the image inside a cargo compartment may be acquired, or it may install in a driver's seat, and the image of a driver's seat may be acquired.

[0038]In the above-mentioned embodiment, when the state of the transport vehicle acquired from the vehicle sensor 3 changed into the state where it was set beforehand, record of the picture and the sound was started, but it may detect that the unspecified person approached the transport vehicle, and record may be started. The data recording part 7 may be made to memorize a date and time information further. The modification of the transport-vehicle crime prevention recording system concerning this embodiment of the invention that detects hereafter that the unspecified person approached the transport vehicle, and memorizes a picture, a sound, and date data is explained.

[0039]Drawing 4 is a mimetic diagram showing the composition of the modification of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. The transport-vehicle crime prevention recording system shown in drawing 4 has the composition of having added the proximity sensor 21, and a date and a time generation part 22 to the transport-vehicle crime prevention recording system shown in drawing 1.

[0040]The proximity sensor 21 consists of an infrared sensor arranged at the place appointed beforehand, an ultrasonic sensor, etc. of a transportation vehicle, if approach of an unspecified person is detected within limits defined beforehand, such as a rear door and near a driver's seat door, will generate an approach detecting signal and will supply it to the A/D conversion part 4.

[0041]A date and the time generation part 22 generate the date data in which a present date and time are shown, and supplies it to the processing control part 6.

[0042]Hereafter, crime prevention data recording processing of the transport-vehicle crime prevention recording system shown in drawing 4 is explained briefly. The processing control part 6 will memorize first the date data generated by the date and the time generation part 22 by the data recording part 7, if the approach detecting signal sent from the proximity sensor 21 via the A/D conversion part 4 is acquired.

[0043]Then, the processing control part 6 carries out analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 via the A/D conversion part 4, and inputs picture image data, voice data, etc. which were changed. The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 by the method which was able to be defined beforehand, and memorizes compressed data one by one by the data recording part 7.

[0044]The processing control part 6 will stop the record of a picture and a sound which was being performed by the data recording part 7, if it distinguishes that the transport vehicle began the run from the speed information acquired from the vehicle sensor 3. As a result, since the picture and sound of the person close to a transport vehicle are recorded automatically, the generation state of a burglar incident can be grasped exactly.

[0045] Although record of the picture and the sound was started according to the start condition of the predetermined record acquired from the vehicle sensor 3 and the proximity sensor 21 and record of the picture and the sound was stopped in the above-mentioned embodiment according to the condition precedent of predetermined record, It detects, and while it is recordable on the recording medium of the data recording part 7, recording that the transport vehicle was attacked may be continued. The position data of a transport vehicle may be further recorded on the data recording part 7. Other modifications of the transport-vehicle crime prevention recording system concerning this embodiment of the invention that detects a shock etc. in a transport vehicle and memorizes a picture, a sound, and position data hereafter are explained.

[0046] Drawing 5 is a mimetic diagram showing the composition of other modifications of the transport-vehicle crime prevention recording system concerning this embodiment of the invention. The transport-vehicle crime prevention recording system shown in drawing 5 has the composition of having added the malfunction detection sensor 31 and the position information generation part 32 to the transport-vehicle crime prevention recording system shown in drawing 1.

[0047] The malfunction detection sensor 31 consists of the impact sensor, vibration sensor, and acceleration sensor which have been arranged at places appointed beforehand, such as the front of a transportation vehicle, if the shock more than the value defined beforehand, etc. are detected, will generate a malfunction detection signal and will supply it to the A/D conversion part 4.

[0048] The position information generation part 32 receives the electric wave from two or more satellites which can be set to GPS (Global Positioning System), generates the present position information by the propagation delay time, and supplies it to the processing control part 6.

[0049] Hereafter, crime prevention data recording processing of the transport-vehicle crime prevention recording system shown in drawing 5 is explained briefly. If the malfunction detection signal sent from the malfunction detection sensor 31 via the A/D conversion part 4 is acquired, the processing control part 6, Analog-to-digital conversion of the video signal and audio signal which are sent from the imaging device 1 and the sound-collecting device 2 is carried out via the A/D conversion part 4, and picture image data, voice data, etc. which were changed are inputted.

[0050] The processing control part 6 compresses the picture image data and voice data which controlled the data compression part 5 and were inputted via the A/D conversion part 4 by the method which was able to be defined beforehand, and memorizes compressed data one by one by the data recording part 7. The processing control part 6 acquires a predetermined time interval, for example, the position information which the position information generation part 32 generated at intervals of 1 minute, and memorizes it one by one to the data recording part 7.

[0051] Memorizing the processing control part 6 is continued until the storage capacity of the opening of the videotape used as the recording medium in the data recording part 7 is lost. As a result, while for the malfunction detection sensor 31 to detect that the transport vehicle was attacked, and it is recordable on the recording medium of the data recording part 7, in order to continue recording a picture, a sound, and position information, When robbed the whole transport vehicle, the whole picture of the incident of a to [from the generation state of a burglar incident / a criminal's escape route, the shipping-and-discharging place of intermediate cash, etc.] can be grasped exactly.

[0052] Although the position information on a transport vehicle was generated, and it

combined with the picture and the sound and being recorded by the position information generation part 32 in the above-mentioned embodiment at the data recording part 7, Position information may be acquired in a security center etc. by having mobile communication apparatus, such as a PHS system, and continuing transmitting commo data from a mobile communication apparatus after detecting abnormalities by the malfunction detection sensor 31 instead of the position information generation part 32.

[0053]In an above-mentioned embodiment, although a picture, a sound, etc. were recorded on videotape by the data recording part 7, the recording medium is arbitrary. For example, it may record on semiconductor memory. The data recording part 7 may be protected by the case for realizing prevention and the endurance defined beforehand of an alteration of the recorded image, a sound, etc. The data recording part 7 is locked with a key for exclusive use, for example, accepts it in a security center, and is good also as unlocking being possible.

[0054]The system of this invention cannot be based on a system for exclusive use, but can be realized using the usual computer system. For example, the transport-vehicle crime prevention recording system which performs above-mentioned processing can be constituted by installing this program from the media (a floppy disk, CD-ROM, etc.) which stored the program for performing one of above-mentioned processings in the computer.

[0055]Communication media (medium which holds a program temporarily and fluidly like a communication line, a communication network, and a communications system) may be sufficient as the medium for supplying a program to a computer. For example, this program may be put up for the bulletin board (BBS) of a communication network, and this may be distributed via a network. And above-mentioned processing can be performed by starting this program and performing like other application programs under control of OS.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a mimetic diagram showing the composition of the transport-vehicle crime prevention recording system concerning an embodiment of the invention.

[Drawing 2] It is a mimetic diagram which has arranged the transport-vehicle crime prevention recording system concerning an embodiment of the invention on the transportation vehicle.

[Drawing 3] It is a flow chart explaining crime prevention data recording processing

of the transport-vehicle crime prevention recording system concerning an embodiment of the invention.

[Drawing 4] It is a mimetic diagram showing the composition of the transport-vehicle crime prevention recording system used as the modification concerning an embodiment of the invention.

[Drawing 5] It is a mimetic diagram showing the composition of the transport-vehicle crime prevention recording system used as other modifications concerning an embodiment of the invention.

[Description of Notations]

- 1 Imaging device
- 2 Sound-collecting device
- 3 Vehicle sensor
- 4 A/D conversion part
- 5 Data compression part
- 6 Processing control part
- 7 Data recording part
- 21 Proximity sensor
- 22 A date and a time generation part
- 31 Malfunction detection sensor
- 32 Position information generation part

[Translation done.]

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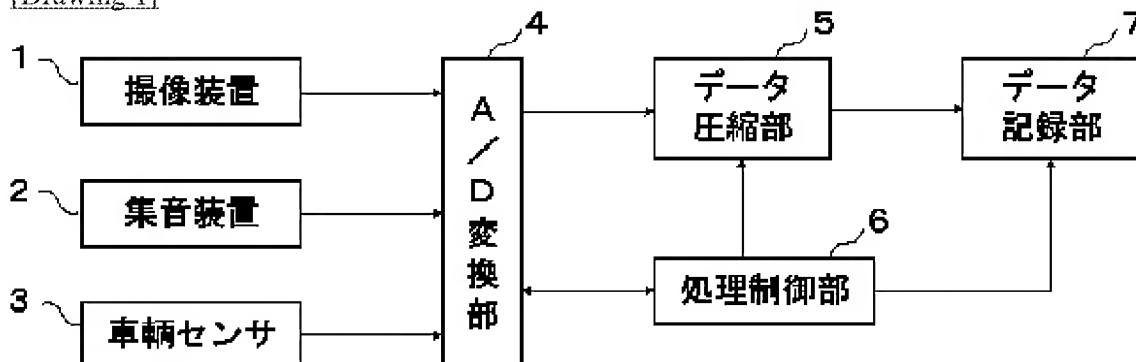
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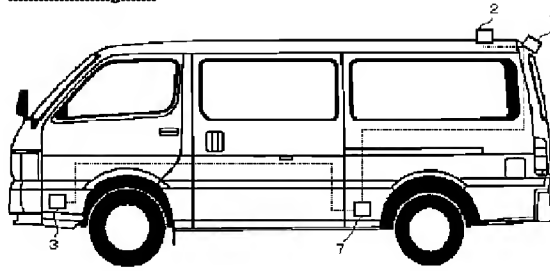
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DRAWINGS

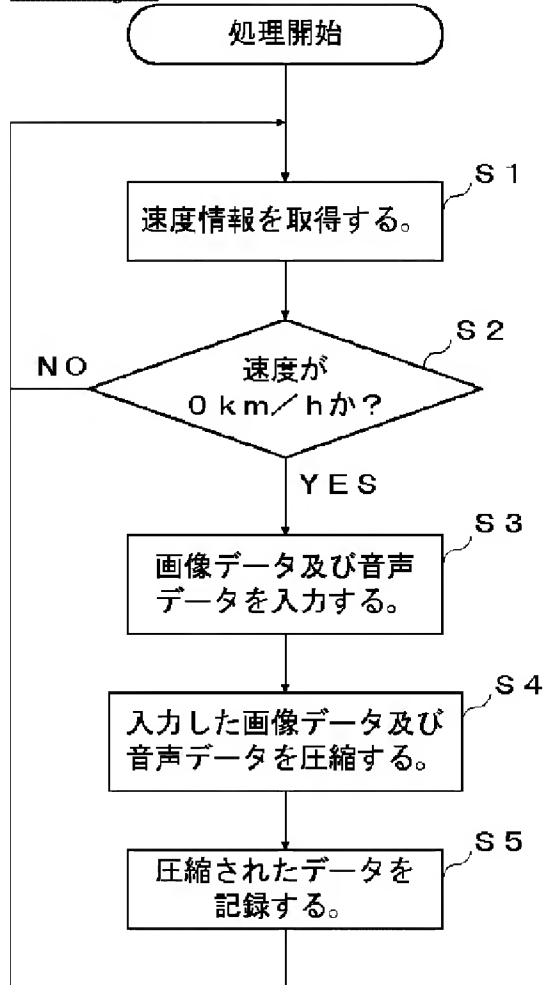
[Drawing 1]



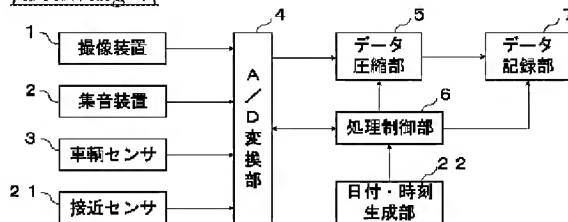
[Drawing 2]



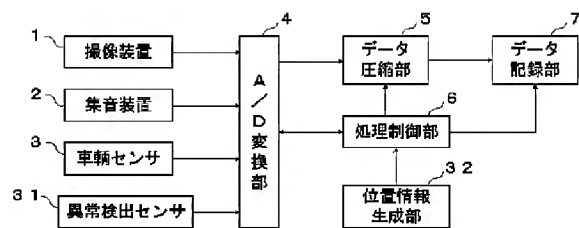
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]

[Drawing 4]

[Drawing 5]

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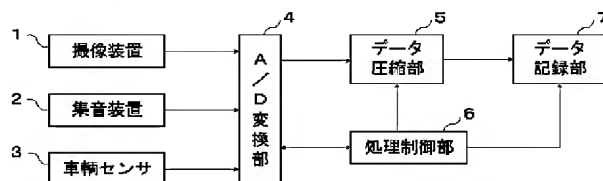
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(54)【発明の名称】 輸送車防犯記録システム、防犯記録方法及び記録媒体

(57)【要約】

【課題】 現金輸送車等が襲撃された際における強盗事件の発生状況を的確に把握することのできる輸送車防犯記録システムを提供する。

【解決手段】 撮像装置1は、輸送車輛からの予め定められた範囲の映像を撮像する。集音装置2は、輸送車輛内外の音声を集音する。処理制御部6は、車輛センサ3から取得した速度情報から、輸送車輛が停止していることを検出すると、撮像装置1にて撮像した映像及び、集音装置2にて集音した音声をA/D変換部4にてデジタルデータに変換後、データ圧縮部5にて圧縮する。処理制御部6は、圧縮後のデータをデータ記録部7にて順次記録する。一方、処理制御部6は、取得した速度情報から、輸送車輛が走行していることを検出すると、データ記録部7にて行っている画像及び音声の記録を停止する。



【特許請求の範囲】

【請求項1】車輦からの映像を撮像する撮像手段と、車輦が停止していることを検出する停止状態検出手段と、車輦が走行していることを検出する走行状態検出手段と、前記停止状態検出手段にて車輦が停止していることを検出すると、前記撮像手段にて撮像した映像を記録し、前記走行状態検出手段にて車輦が走行していることを検出すると、前記撮像手段にて撮像した映像の記録を中断するデータ記録手段と、を備えることを特徴とする輸送車防犯記録システム。

【請求項2】前記停止状態検出手段は、取得した車輦の速度が予め定められた速度以下の場合に、車輦が停止していることを検出し、前記走行状態検出手段は、取得した車輦の速度が予め定められた速度より大きい場合に、車輦が走行していることを検出する、ことを特徴とする請求項1に記載の輸送車防犯記録システム。

【請求項3】前記停止状態検出手段は、車輦のエンジンが起動状態から停止状態に変化した場合に、車輦が停止していることを検出する、ことを特徴とする請求項1又は2に記載の輸送車防犯記録システム。

【請求項4】前記停止状態検出手段は、車輦に設置されたジャイロセンサから取得した車体の振動が予め定められた時間中、予め定められた値以下である場合に、車輦が停止していることを検出する、ことを特徴とする請求項1、2又は3に記載の輸送車防犯記録システム。

【請求項5】車輦から予め定められた範囲内に人間が接近していることを検出する対人接近検出手段を備え、前記データ記録手段は、前記対人接近検出手段にて接近者がいることを検出すると、前記撮像手段にて撮像した映像を記録し、前記走行状態記録手段にて車輦が走行していることを検出すると、前記撮像手段にて撮像した映像の記録を中断する、ことを特徴とする請求項1乃至4のいずれか1項に記載の輸送車防犯記録システム。

【請求項6】車輦に対する予め定められた値以上の衝撃を検出する衝撃検出手段を備え、前記データ記録手段は、前記衝撃検出手段にて衝撃を検出すると、前記撮像手段にて撮像した映像の記録を開始する、ことを特徴とする請求項1乃至5のいずれか1項に記載の輸送車防犯記録システム。

【請求項7】現在の日付及び時刻となる日時データを生成する日時データ生成手段と、現在の車輦の位置となる位置データを生成する位置デー

タ生成手段とを備え、

前記データ記録手段は、前記撮像手段にて撮像した映像に加えて、前記日時データ生成手段にて生成した日時データと、前記位置データ生成手段にて生成した位置データとを記録する、ことを特徴とする請求項1乃至6のいずれか1項に記載の輸送車防犯記録システム。

【請求項8】前記データ記録手段は、記録された映像及び音声の改竄の防止及び、予め定められた耐久性を実現するための筐体に保護される、ことを特徴とする請求項1乃至7のいずれか1項に記載の輸送車防犯記録システム。

【請求項9】車輦からの映像を撮像する撮像ステップと、車輦が停止していることを検出する停止状態検出ステップと、車輦が走行していることを検出する走行状態検出ステップと、前記停止状態検出ステップにて車輦が停止していることを検出すると、前記撮像ステップにて撮像した映像を記録し、前記走行状態検出ステップにて車輦が走行していることを検出すると、前記撮像ステップにて撮像した映像の記録を中断するデータ記録ステップと、を備えることを特徴とする防犯記録方法。

【請求項10】コンピュータを輸送車防犯記録システムとして機能させるプログラムを記録するコンピュータ読み取り可能な記録媒体であって、車輦からの映像を撮像する撮像ステップと、車輦が停止していることを検出する停止状態検出ステップと、車輦が走行していることを検出する走行状態検出ステップと、前記停止状態検出ステップにて車輦が停止していることを検出すると、前記撮像ステップにて撮像した映像を記録し、前記走行状態検出ステップにて車輦が走行していることを検出すると、前記撮像ステップにて撮像した映像の記録を中断するデータ記録ステップと、を実現するプログラムを記憶する、ことを特徴とするコンピュータ読み取り可能な記録媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、現金輸送車等が襲撃された際における強盗事件の発生状況を的確に把握することのできる輸送車防犯記録システム、防犯記録方法及び記録媒体に関する。

【0002】

【従来の技術】従来、現金輸送車等が襲撃されるといった強盗事件発生時において、輸送車に同乗している警備員等は、無線等によりいち早く警備センタや警察に事件発生を知らせると共に、現金等の強奪を未然に防ごうと努力する。未然に防げた場合でも、現金等が強奪された場合でも、犯人が逃走してしまった後では、犯人の人

数、人相、体格、性別、年齢及び手口といった強盗事件発生状況を的確に把握することが必要となる。そのため、捜査官等は、強盗事件発生後に残された様々な物証等の分析や警備員及び目撃者等から得られた証言により強盗事件発生状況を把握する。その際、事件発生後に残された物証等や、警備員等の証言からでは、事件発生状況を的確に捉えることが困難な場合が多かった。事件発生状況が的確に捉えられないと、犯人の検挙に時間が掛かったり、検挙が困難となるだけでなく、犯罪の抑止効果が得られず、更なる同様な犯罪を誘発することとなる。

【0003】近年では、特開平8-171682号に開示されているような、強盗事件発生時の画像情報を無線通信により警備センタに伝送して事件発生を通報すると共に、伝送した情報と同一の画像情報をフレームメモリに記録し、強盗事件の発生状況を捉えようとする技術が公開されている。

【0004】

【発明が解決しようとする課題】しかし、特開平8-171682号に開示されている技術は、現金輸送車の貨物室のドアに備えられたセンサがドアの開放を検出することにより撮影を開始し、取得した画像情報を警備センタに伝送する。このため、輸送車の貨物室のドアが開けられるという強盗事件におけるほんの一部を撮影するに止まり、強盗事件の全容を的確に捉えることが困難であった。

【0005】また、無線通信に使用される周波数帯に妨害のための高出力な電波を発生させられたり、通信のためのアンテナ等が破壊されると、撮影された画像情報が警備センタに届かないおそれがあった。更に、フレームメモリの容量から保存可能となる画像情報のデータ量が十分確保できない場合や、フレームメモリに記録した画像を再生するのに専用の機材が必要となり、初期捜査の遅れを招くおそれもあった。

【0006】本発明は、上記実状に鑑みてなされたもので、現金輸送車等が襲撃された強盗事件の発生状況を的確に把握することのできる輸送車防犯記録システム、防犯記録方法及び記録媒体を提供することを目的とする。

【0007】

【課題を解決するための手段】上記目的を達成するため、この発明の第1の観点に係る輸送車防犯記録システムは、車輦からの映像を撮像する撮像手段と、車輦が停止していることを検出する停止状態検出手段と、車輦が走行していることを検出する走行状態検出手段と、前記停止状態検出手段にて車輦が停止していることを検出すると、前記撮像手段にて撮像した映像を記録し、前記走行状態検出手段にて車輦が走行していることを検出すると、前記撮像手段にて撮像した映像の記録を中断するデータ記録手段と、を備えることを特徴とする。

【0008】この発明によれば、撮像手段は、車輦から

の予め定められた範囲の映像を撮像する。データ記録手段は、停止状態検出手段にて車輦が停止していることを検出すると、撮像手段にて撮像した映像を記録し、走行状態検出手段にて車輦が走行していることを検出すると、撮像手段にて撮像した映像の記録を中断する。この結果、一般に強盗事件が発生する前提となる輸送車の停止状態における所定範囲の画像を自動的に記録するため、強盗事件の発生状況を的確に把握することができる。

【0009】前記停止状態検出手段は、取得した車輦の速度が予め定められた速度以下の場合に、車輦が停止していることを検出し、前記走行状態検出手段は、取得した車輦の速度が予め定められた速度より大きい場合に、車輦が走行していることを検出してもよい。この場合、停止状態検出手段は、輸送車の速度値を速度センサ等により取得し、取得した速度値が例えば、0km/hの場合に車輦が停止していることを検出する。また、走行状態検出手段は、取得した速度値が例えば、0km/hより大きい場合に車輦が走行していることを検出する。

【0010】前記停止状態検出手段は、車輦のエンジンが起動状態から停止状態に変化した場合に、車輦が停止していることを検出してもよい。

【0011】前記停止状態検出手段は、車輦に設置されたジャイロセンサから取得した車体の振動が予め定められた時間中、予め定められた値以下である場合に、車輦が停止していることを検出してもよい。

【0012】車輦から予め定められた範囲内に人間が接近していることを検出する対人接近検出手段を備え、前記データ記録手段は、前記対人接近検出手段にて接近者がいることを検出すると、前記撮像手段にて撮像した映像を記録し、前記走行状態記録手段にて車輦が走行していることを検出すると、前記撮像手段にて撮像した映像の記録を中断してもよい。この場合、輸送車に接近する人物の画像を自動的に記録するため、強盗事件の発生状況を的確に把握することができる。

【0013】車輦に対する予め定められた値以上の衝撃を検出する衝撃検出手段を備え、前記データ記録手段は、前記衝撃検出手段にて衝撃を検出すると、前記撮像手段にて撮像した映像の記録を開始してもよい。この場合、輸送車を強引に停止させようとするような衝撃を検出し、所定の範囲の画像を自動的に記録するため、強盗事件の発生状況を的確に把握することができる。

【0014】現在の日付及び時刻となる日時データを生成する日時データ生成手段と、現在の車輦の位置となる位置データを生成する位置データ生成手段とを備え、前記データ記録手段は、前記撮像手段にて撮像した映像に加えて、前記日時データ生成手段にて生成した日時データと、前記位置データ生成手段にて生成した位置データとを記録してもよい。

【0015】前記データ記録手段は、記録された映像及

び音声の改竄の防止及び、予め定められた耐久性を実現するための筐体に保護されてもよい。

【0016】上記目的を達成するため、この発明の第2の観点に係る防犯記録方法は、車輛からの映像を撮像する撮像ステップと、車輛が停止していることを検出する停止状態検出ステップと、車輛が走行していることを検出する走行状態検出ステップと、前記停止状態検出ステップにて車輛が停止していることを検出すると、前記撮像ステップにて撮像した映像を記録し、前記走行状態検出ステップにて車輛が走行していることを検出すると、前記撮像ステップにて撮像した映像の記録を中断するデータ記録ステップと、を備えることを特徴とする。

【0017】この発明によれば、撮像ステップは、車輛からの予め定められた範囲の映像を撮像する。データ記録ステップは、停止状態検出ステップにて車輛が停止していることを検出すると、撮像ステップにて撮像した映像を記録し、走行状態検出ステップにて車輛が走行していることを検出すると、撮像ステップにて撮像した映像の記録を中断する。この結果、一般に強盗事件が発生する前提となる輸送車の停止状態における所定範囲の画像を自動的に記録するため、強盗事件の発生状況を的確に把握することができる。

【0018】上記目的を達成するため、この発明の第3の観点に係る記録媒体は、コンピュータを輸送車防犯記録システムとして機能させるプログラムを記録するコンピュータ読み取り可能な記録媒体であって、車輛からの映像を撮像する撮像ステップと、車輛が停止していることを検出する停止状態検出ステップと、車輛が走行していることを検出する走行状態検出ステップと、前記停止状態検出ステップにて車輛が停止していることを検出すると、前記撮像ステップにて撮像した映像を記録し、前記走行状態検出ステップにて車輛が走行していることを検出すると、前記撮像ステップにて撮像した映像の記録を中断するデータ記録ステップと、を実現するプログラムを記憶することを特徴とする。

【0019】

【発明の実施の形態】本発明の実施の形態にかかる輸送車防犯記録システムについて以下図面を参照して説明する。

【0020】図1は、この発明の実施の形態にかかる輸送車防犯記録システムの構成を示す模式図である。この輸送車防犯記録システムは、図1に示すように、撮像装置1と、集音装置2と、車輛センサ3と、A/D（アナログ／デジタル）変換部4と、データ圧縮部5と、処理制御部6と、データ記録部7と、を備える。

【0021】撮像装置1は、図2に示すように輸送車輛の予め定められた場所に配置され、配置位置から撮像した所定範囲の映像を取得し、動画の映像信号を生成してA/D変換部4に順次供給する。なお、撮像装置1を複数配置して、同時期に複数の映像を取得してもよい。

【0022】集音装置2は、図2に示すように輸送車輛の予め定められた場所に配置され、配置位置から集音した音声等を取得し、音声信号を生成してA/D変換部4に順次供給する。なお、集音装置2を複数配置して、複数箇所の音声等を取得してもよい。

【0023】車輛センサ3は、車速センサ、加速センサ及び、ブレーキセンサ等からなり、車速情報、加速度情報及び、ブレーキ操作情報をそれぞれ順次取得し、A/D変換部4に供給する。

【0024】A/D（アナログ／デジタル）変換部4は、撮像装置1、集音装置2及び、車輛センサ3から入力した映像信号及び音声信号等の各種アナログ信号をデジタル信号に変換し、データ圧縮部5及び処理制御部6に順次供給する。

【0025】データ圧縮部5は、A/D変換部4から受信した映像データ及び音声データ等を予め定められた圧縮方式、例えばMPEG（Motion Picture Expert Group）方式により圧縮し、データ記録部7に供給する。

【0026】処理制御部6は、輸送車防犯記録システム全体を制御する。処理制御部6は、A/D変換部4を介して車輛センサ3から送られた速度情報が、予め定められた速度以下となると、撮像装置1及び集音装置2から取得した画像及び音声の記録を開始する。すなわち、処理制御部6は、A/D変換部4、データ圧縮部5及び、データ記録部7を制御し、A/D変換部4からの映像データ及び音声データ等の出力にタイミングを合わせてデータ圧縮部5にてデータを順次圧縮し、圧縮したデータをデータ記録部7に順次記憶する。

【0027】データ記録部7は、VTR（ビデオテープレコーダ）等からなり、予め定められた記憶容量のビデオテープが内蔵され、データ圧縮部5から供給された圧縮データを順次記録する。なお、データ記録部7は、図2に示すように輸送車輛の比較的衝撃を受けにくい後方に配置され、専用の鍵にて施錠される。

【0028】次に、この発明の実施の形態にかかる輸送車防犯記録システムの防犯データ記録処理について、図3を参照して説明する。図3は、この輸送車防犯記録システムにおける防犯データ記録処理を説明するフローチャートである。なお、防犯データ記録処理は、所定の出発地点例えば警備センタにおいて所定の操作により開始される。

【0029】まず、処理制御部6は、A/D変換部4を介して車輛センサ3から送られた速度情報を取得する（ステップS1）。処理制御部6は、取得した速度情報が0 km/hであるか否かを判別する（ステップS2）。すなわち、処理制御部6は、輸送車が停止している状態か否かを判別する。処理制御部6は、取得した速度情報が0 km/hでない場合、ステップS1に戻って処理を繰り返す。一方、取得した速度情報が0 km/hである場合、処理制御部6は、撮像装置1及び、集音装

置2から送られる映像信号及び音声信号をA/D変換部4を介してアナログ/デジタル変換し、変換された映像データ及び音声データ等を入力する(ステップS3)。

【0030】処理制御部6は、データ圧縮部5を制御してA/D変換部4を介して入力した映像データ及び音声データを予め定められた方式、例えばMPEG方式にて圧縮する(ステップS4)。

【0031】処理制御部6は、データ圧縮部5にて圧縮された映像データ及び音声データをデータ記録部7にて順次記憶する(ステップS5)。

【0032】処理制御部6は、ステップS1に戻って上記の処理を繰り返す。すなわち、処理制御部6は、ステップS2にて輸送車が走行を始めたことと判別すると、データ記録部7にて行っていた画像及び音声の記録を停止する。なお、防犯データ記録処理は、所定の到着地点例えば警備センタにおいて所定の操作により終了する。

【0033】この結果、一般に強盗事件が発生する前提となる輸送車の停止状態における所定範囲の画像及び音声自動的に記録するため、強盗事件の発生した際に、事件の発生状況を的確に把握することができる。また、事件が発生しなかった場合でも、画像及び音声を記録したビデオテープを管理することにより、強盗事件の前兆を捉えて対策を講ずることもできる。

【0034】上述の実施の形態では、画像及び音声をデータ圧縮部5にて圧縮したデータをデータ記録部7にて記録したが、圧縮せずにそのまま記録してもよい。圧縮されずにそのまま記録されたビデオテープは、汎用の機材にて再生可能なため、強盗事件発生時における初期捜査の遅れを招くことがなくなる。

【0035】上述の実施の形態では、車載センサ3から取得した速度情報が0 km/hとなると画像及び音声の記録を開始したが、記録を開始する速度情報の値は任意である。例えば、車載センサ3から取得した速度情報が10 km/h以下となると記録を開始してもよい。また、車載センサ3から取得した加速度情報及び、ブレーキ操作情報との組み合わせにより、記録を開始してもよい。

【0036】上述の実施の形態では、車載センサ3から取得した速度情報が0 km/hとなると画像及び音声の記録を開始したが、輸送車のエンジンが停止すると画像及び音声の記録を開始してもよい。例えば、車載センサ3にてエンジンの起動及び停止を判別できるようにし、エンジンが起動状態から停止状態に変化した場合に記録を開始してもよい。また、ジャイロセンサ等を更に備え、ジャイロセンサから取得した車体の振動が予め定められた時間中、予め定められた値以下である場合に、記録を開始してもよい。

【0037】上述の実施の形態では、撮像装置1は、輸送車輻の予め定められた箇所に設置され、設置位置から所定範囲の映像を取得したが、撮像装置1を回転可能と

して、撮影範囲を変化させてもよい。例えば、撮像装置1を処理制御部6にて制御可能な電動の回転台の上に設置し、複数の集音装置2から取得した音声の強弱等から音声の発生源を捉え、処理制御部6にて撮像装置1の撮影範囲を自動的に変更してもよい。また、撮像装置1の設置箇所は任意である。例えば、輸送車両の貨物室に設置し、貨物室内部の映像を取得したり、運転席に設置し、運転席の映像を取得してもよい。

【0038】上述の実施の形態では、車載センサ3から取得した輸送車の状態が予め定められた状態となった際に、画像及び音声の記録を開始したが、輸送車に不特定の人物が接近したことを検出して、記録を開始してもよい。また、データ記録部7に日付及び時刻情報を更に記憶させてもよい。以下、輸送車に不特定の人物が接近したことを検出して画像、音声及び日時データを記憶するこの発明の実施の形態に係る輸送車防犯記録システムの変形例について説明する。

【0039】図4は、この発明の実施の形態に係る輸送車防犯記録システムの変形例の構成を示す模式図である。図4に示す輸送車防犯記録システムは、図1に示す輸送車防犯記録システムに、接近センサ21と、日付・時刻生成部22とを追加した構成となっている。

【0040】接近センサ21は、輸送車輻の予め定められた場所に配置された赤外線センサ及び、超音波センサ等からなり、後部ドアや運転席ドア付近等の予め定められた範囲内に不特定の人物の接近を検出すると接近検出信号を生成し、A/D変換部4に供給する。

【0041】日付・時刻生成部22は、現在の日付及び時刻を示す日時データを生成し、処理制御部6に供給する。

【0042】以下、図4に示す輸送車防犯記録システムの防犯データ記録処理について簡単に説明する。処理制御部6は、A/D変換部4を介して接近センサ21から送られた接近検出信号を取得すると、日付・時刻生成部22にて生成された日時データをデータ記録部7にて最初に記憶する。

【0043】その後、処理制御部6は、撮像装置1及び、集音装置2から送られる映像信号及び音声信号をA/D変換部4を介してアナログ/デジタル変換し、変換された映像データ及び音声データ等を入力する。処理制御部6は、データ圧縮部5を制御してA/D変換部4を介して入力した映像データ及び音声データを予め定められた方式にて圧縮し、圧縮したデータをデータ記録部7にて順次記憶する。

【0044】なお、処理制御部6は、車載センサ3から取得した速度情報から輸送車が走行を始めたことを判別すると、データ記録部7にて行っていた画像及び音声の記録を停止する。この結果、輸送車に接近する人物の画像及び音声を自動的に記録するため、強盗事件の発生状況を的確に把握することができる。

【0045】上述の実施の形態では、車輛センサ3及び接近センサ21から取得した所定の記録の開始条件に従って画像及び音声の記録を開始し、所定の記録の停止条件に従って画像及び音声の記録を停止したが、輸送車が襲撃されたことを検出して、データ記録部7の記録媒体に記録可能な間、記録し続けてもよい。また、データ記録部7に輸送車の位置データを更に記録してもよい。以下、輸送車において衝撃等を検出して画像、音声及び位置データを記憶するこの発明の実施の形態に係る輸送車防犯記録システムの他の変形例について説明する。

【0046】図5は、この発明の実施の形態に係る輸送車防犯記録システムの他の変形例の構成を示す模式図である。図5に示す輸送車防犯記録システムは、図1に示す輸送車防犯記録システムに、異常検出センサ31と、位置情報生成部32とを追加した構成となっている。

【0047】異常検出センサ31は、輸送車輛の前方等の予め定められた場所に配置された衝撃センサ、振動センサ及び加速度センサからなり、予め定められた値以上の衝撃等を検出すると異常検出信号を生成し、A/D変換部4に供給する。

【0048】位置情報生成部32は、GPS (Global Positioning System) における複数の衛星からの電波を受信し、その伝搬遅延時刻により現在の位置情報を生成し、処理制御部6に供給する。

【0049】以下、図5に示す輸送車防犯記録システムの防犯データ記録処理について簡単に説明する。処理制御部6は、A/D変換部4を介して異常検出センサ31から送られた異常検出信号を取得すると、撮像装置1及び、集音装置2から送られる映像信号及び音声信号をA/D変換部4を介してアナログ/デジタル変換し、変換された映像データ及び音声データ等を入力する。

【0050】処理制御部6は、データ圧縮部5を制御してA/D変換部4を介して入力した映像データ及び音声データを予め定められた方式にて圧縮し、圧縮したデータをデータ記録部7にて順次記憶する。また、処理制御部6は、所定の時間間隔、例えば、1分間隔で位置情報生成部32が生成した位置情報を取得し、データ記録部7に順次記憶する。

【0051】なお、処理制御部6は、データ記録部7における記録媒体となるビデオテープの空きの記憶容量がなくなるまで記憶し続ける。この結果、輸送車が襲撃されたことを異常検出センサ31にて検出して、データ記録部7の記録媒体に記録可能な間、画像、音声及び位置情報を記録し続けるため、輸送車ごと強奪された場合等に、強盗事件の発生状況から犯人の逃走経路や、途中の現金の積みおろし場所等に至るまでの事件の全容を的確に把握することができる。

【0052】上記の実施の形態では、位置情報生成部32により、輸送車の位置情報を生成し、データ記録部7にて画像及び音声と併せて記録したが、位置情報生成部

32の代わりに、PHSシステム等の移動体通信装置を備え、異常検出センサ31にて異常を検出後、移動体通信装置から通信データを送信し続けることにより、警備センタ等にて位置情報を取得してもよい。

【0053】上述の実施の形態では、画像及び音声等をデータ記録部7にてビデオテープに記録したが、記録媒体は、任意である。例えば、半導体メモリに記録してもよい。また、データ記録部7は、記録された映像及び音声等の改竄の防止及び、予め定められた耐久性を実現するための筐体に保護されてもよい。さらに、データ記録部7は、専用の鍵で施錠され、例えば、警備センタにてのみ開錠可能としてもよい。

【0054】なお、この発明のシステムは、専用のシステムによらず、通常のコンピュータシステムを用いて実現可能である。例えば、コンピュータに上述のいずれかの処理を実行するためのプログラムを格納した媒体（フロッピーディスク、CD-ROM等）から該プログラムをインストールすることにより、上述の処理を実行する輸送車防犯記録システムを構成することができる。

【0055】また、コンピュータにプログラムを供給するための媒体は、通信媒体（通信回線、通信ネットワーク、通信システムのように、一時的かつ流動的にプログラムを保持する媒体）でも良い。例えば、通信ネットワークの掲示板（BBS）に該プログラムを掲示し、これをネットワークを介して配信してもよい。そして、このプログラムを起動し、OSの制御下で、他のアプリケーションプログラムと同様に実行することにより、上述の処理を実行することができる。

【0056】

【発明の効果】以上説明したように、本発明によれば、現金輸送車等が襲撃された強盗事件の発生状況を的確に把握することができる。

【図面の簡単な説明】

【図1】本発明の実施の形態に係る輸送車防犯記録システムの構成を示す模式図である。

【図2】本発明の実施の形態に係る輸送車防犯記録システムを輸送車輛に配置した模式図である。

【図3】本発明の実施の形態に係る輸送車防犯記録システムの防犯データ記録処理を説明するフローチャートである。

【図4】本発明の実施の形態に係る変形例となる輸送車防犯記録システムの構成を示す模式図である。

【図5】本発明の実施の形態に係る他の変形例となる輸送車防犯記録システムの構成を示す模式図である。

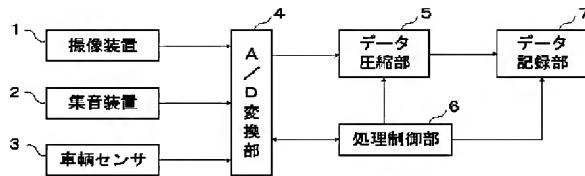
【符号の説明】

- 1 撮像装置
- 2 集音装置
- 3 車輛センサ
- 4 A/D変換部
- 5 データ圧縮部

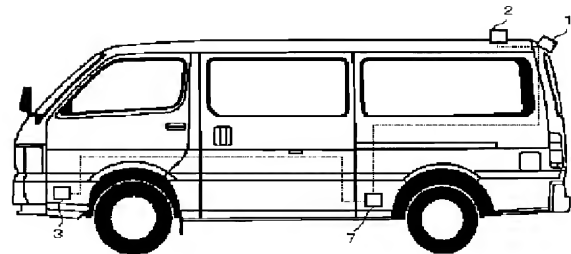
- 6 処理制御部
- 7 データ記録部
- 21 接近センサ

- 22 日付・時刻生成部
- 31 異常検出センサ
- 32 位置情報生成部

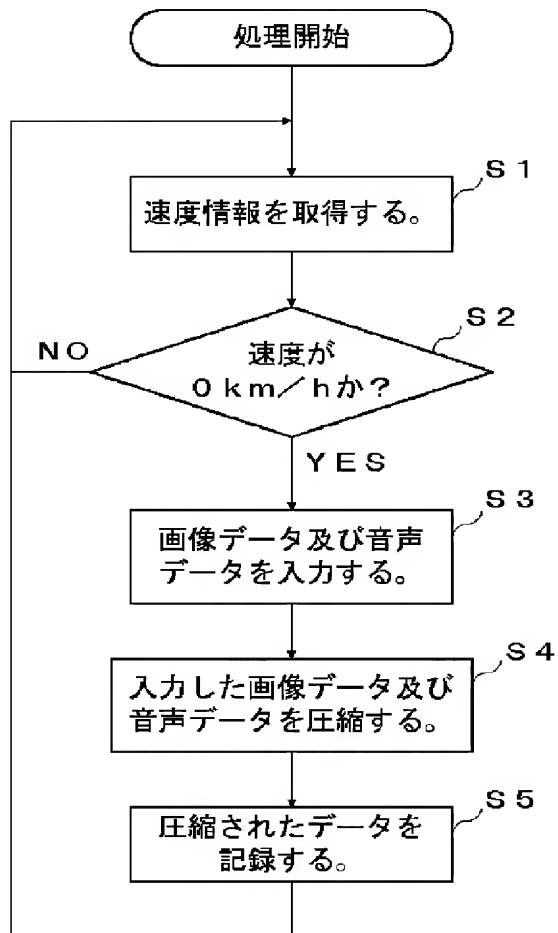
【図1】



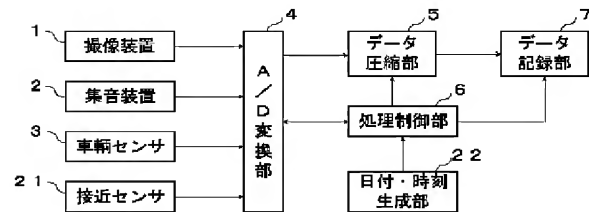
【図2】



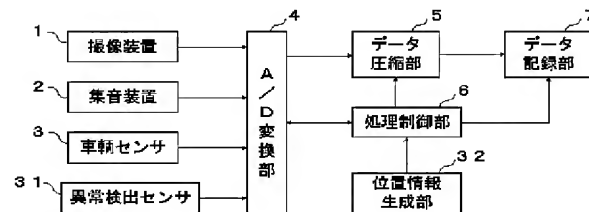
【図3】



【図4】



【図5】



フロントページの続き

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GD03 GD06 HA18 HA26
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AA13 BB31 CC06 CC19 DD02
DD11 DD79 DD80 EE06 GG42
GG65 GG80